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The **VAMOX**™ System

2008 U.S. CMM Conference
October 28th
Pittsburgh, PA


We made a commitment to
clean up our carbon footprint

Two ways to make it happen

Mandatory

Voluntary

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In either case one can...

Pay someone to do it for him

Get paid to do it for someone

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Carbon market

Sales of emission offsets
totaled **13,6 $billion** in 2007,
up **109%** from 2006*

*source: World Bank, 2008

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Carbon credits market value

Mandatory: **19,4 $**/$tCO_2e$*

Voluntary: **6,1 $**/$tCO_2e$†

*source: European Climate Exchange, 2008/10/28

† source: Ecosystem Marketplace / New Carbon Finance, 2008

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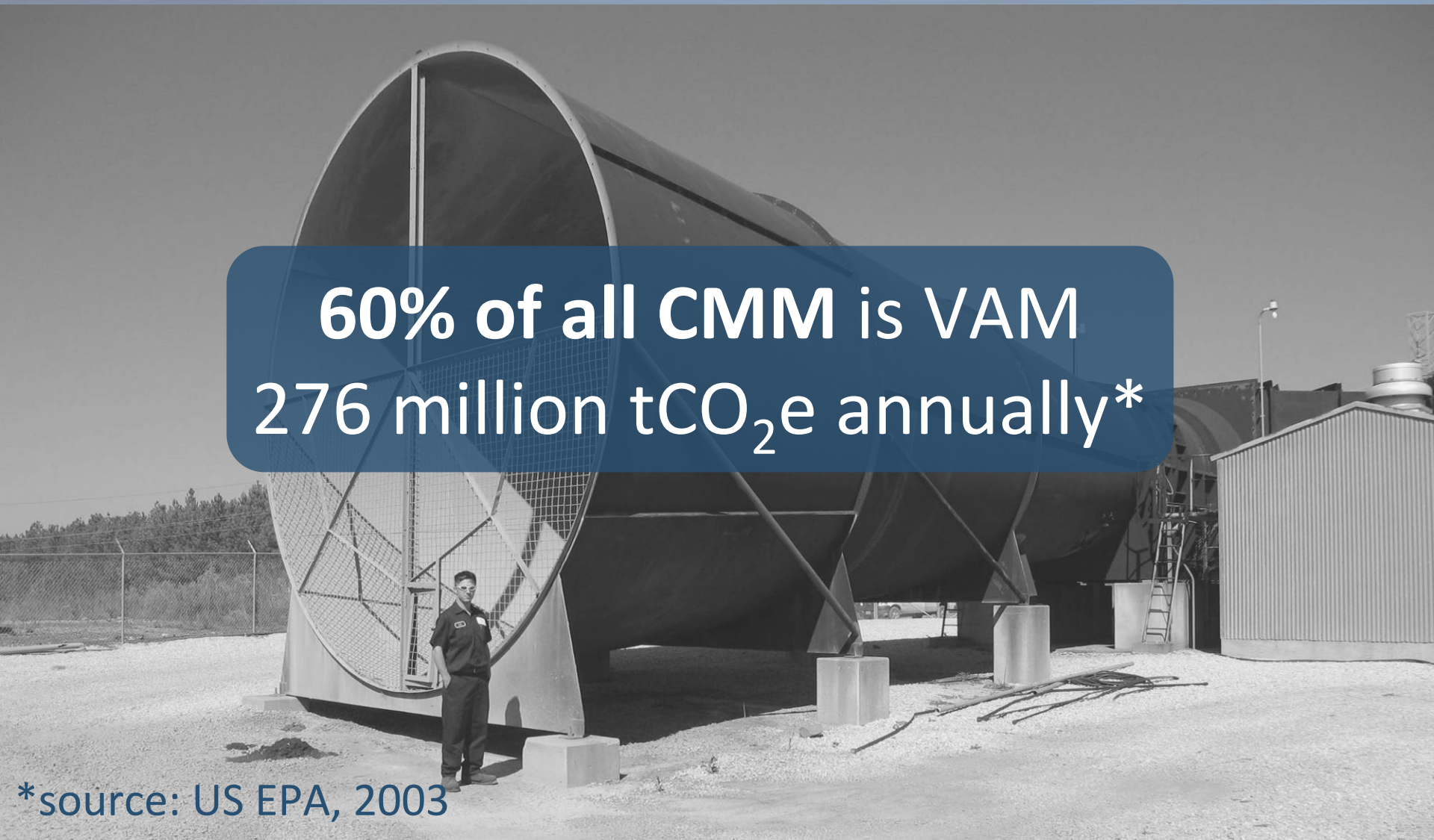
Ventilation air methane



60% of all CMM is VAM
276 million tCO_2e annually*

*source: US EPA, 2003

Potential VAM market

=

403 million$
annually*

*source: US EPA, 2003 & 10 $/$tCO_2e$

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Typical case study

One shaft

(300 000 ft^3/min @ 0,5% methane)

can generate **2,5 $million/year***

*10 $/$tCO_2e$

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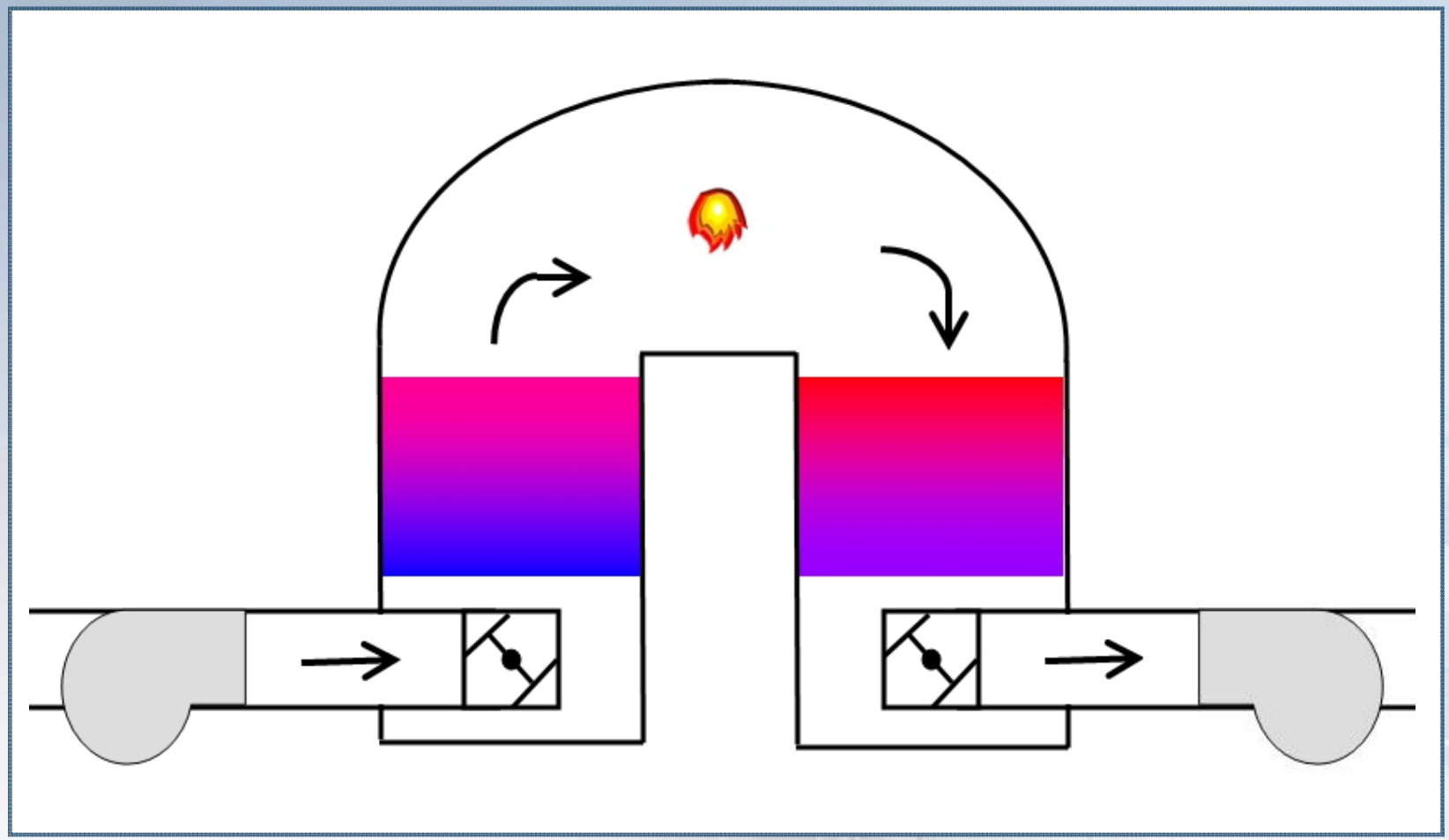
How can you tap into VAM?

The VAMOX™ system

- Highly **efficient** regenerative thermal oxidizer (RTO)
- Inspired by **BIOTOX®** **air pollution control** solution

Regenerative thermal oxidation



BIOTOX® experience

- Since **1993**
- Leader of **non-traditional** applications
- Processes **condensable gases** (pitch & tar fumes)
- **Award** winner from

VAM is simple for Biothermica

pitch & tar

methane

VAMOX™ highlights

- Large unit capacity **minimizes capex** (100 000 ft^3/min)
- Unique design **prevents overheat** (up to 1,2% CH_4)
- As low as **0,2% CH_4**
- **Proven reliability**
- **20 years** service life

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VAMOX™ highlights

- Up to 98% CH_4 destruction
- **Automated** operation
- **Remote monitoring** & diagnostic
- Pneumatic damper actuators
- **Minimum maintenance**
  (2 days per year down time)

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Safety considerations

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Not connected to mine ventilation system

ventilation shaft evasé

VAMOX™ inlet

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No flammable gas mixture can enter the VAMOX™

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Developer's considerations

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Methane level matters most

installed capacity = **capex**

methane level = **revenues**

0,3% CH_4

0,5% CH_4

0,7% CH_4

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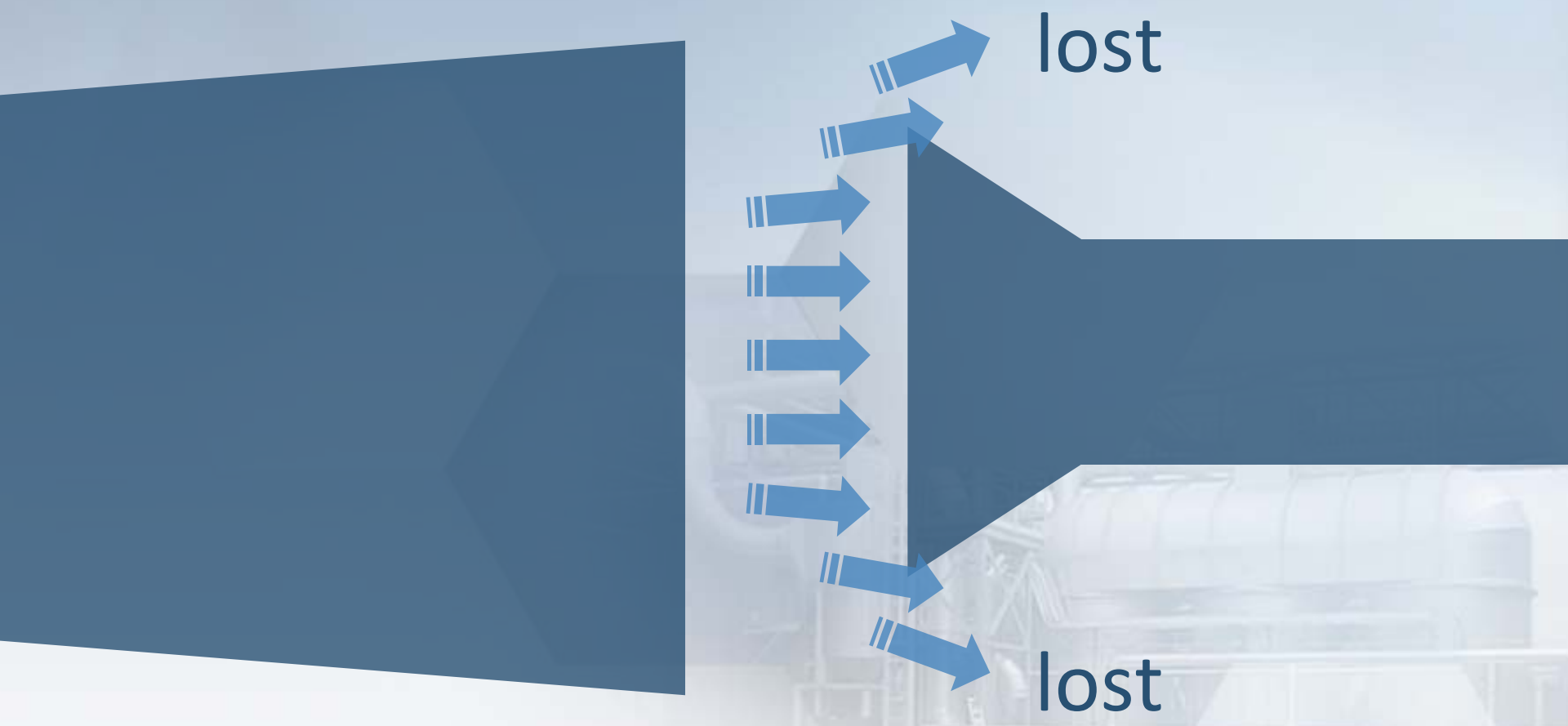
No direct connection implies partial air capture



Shaft service life

Consider it,
moving is **expensive**

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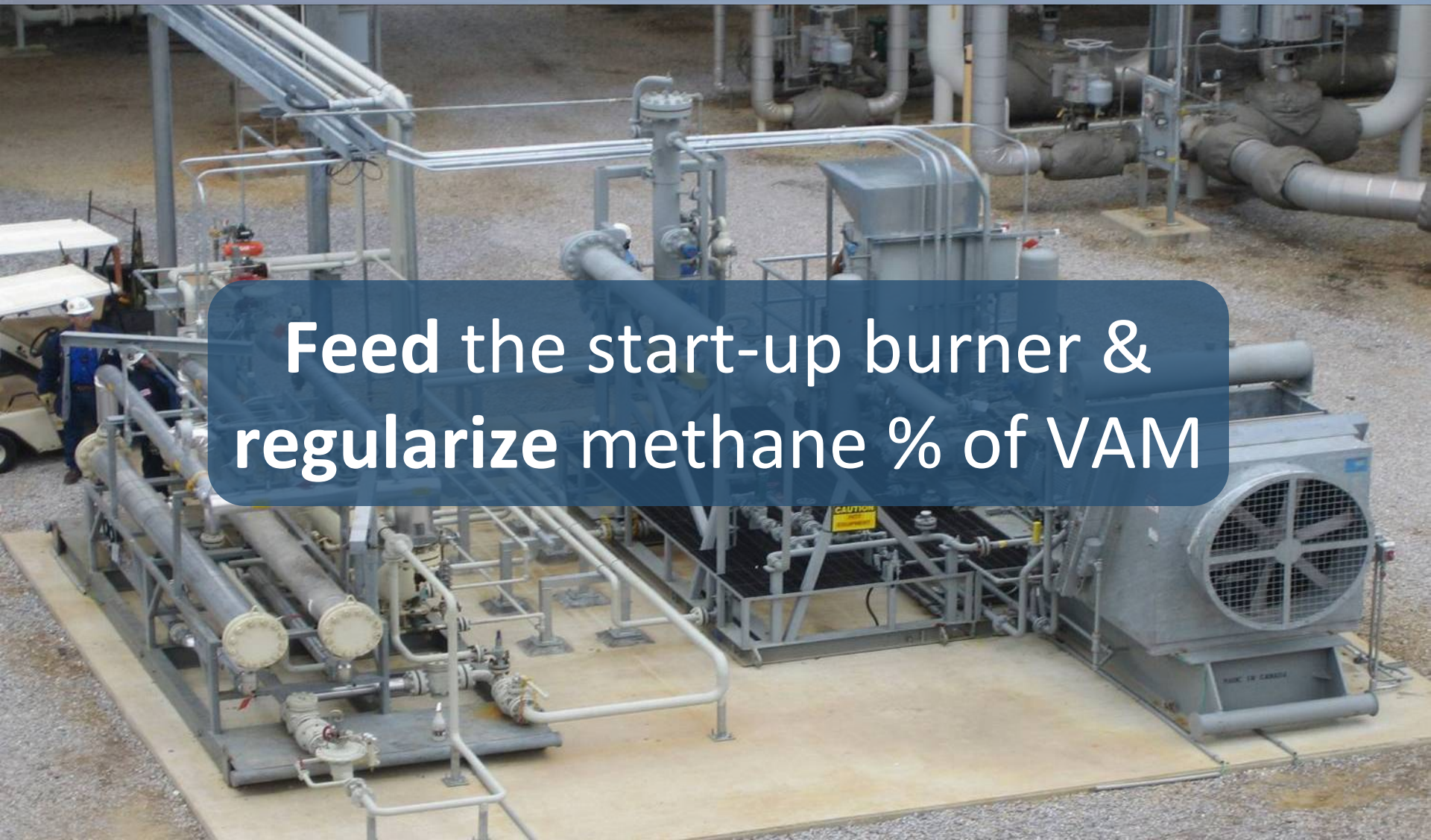
You need room

Largest VAMOX™ & accessories takes up a **basketball court**

Use CMM if available



Local need for thermal energy?

Beyond 0,3% CH_4 the VAMOX™ can produce **hot water** or low-grade **steam**

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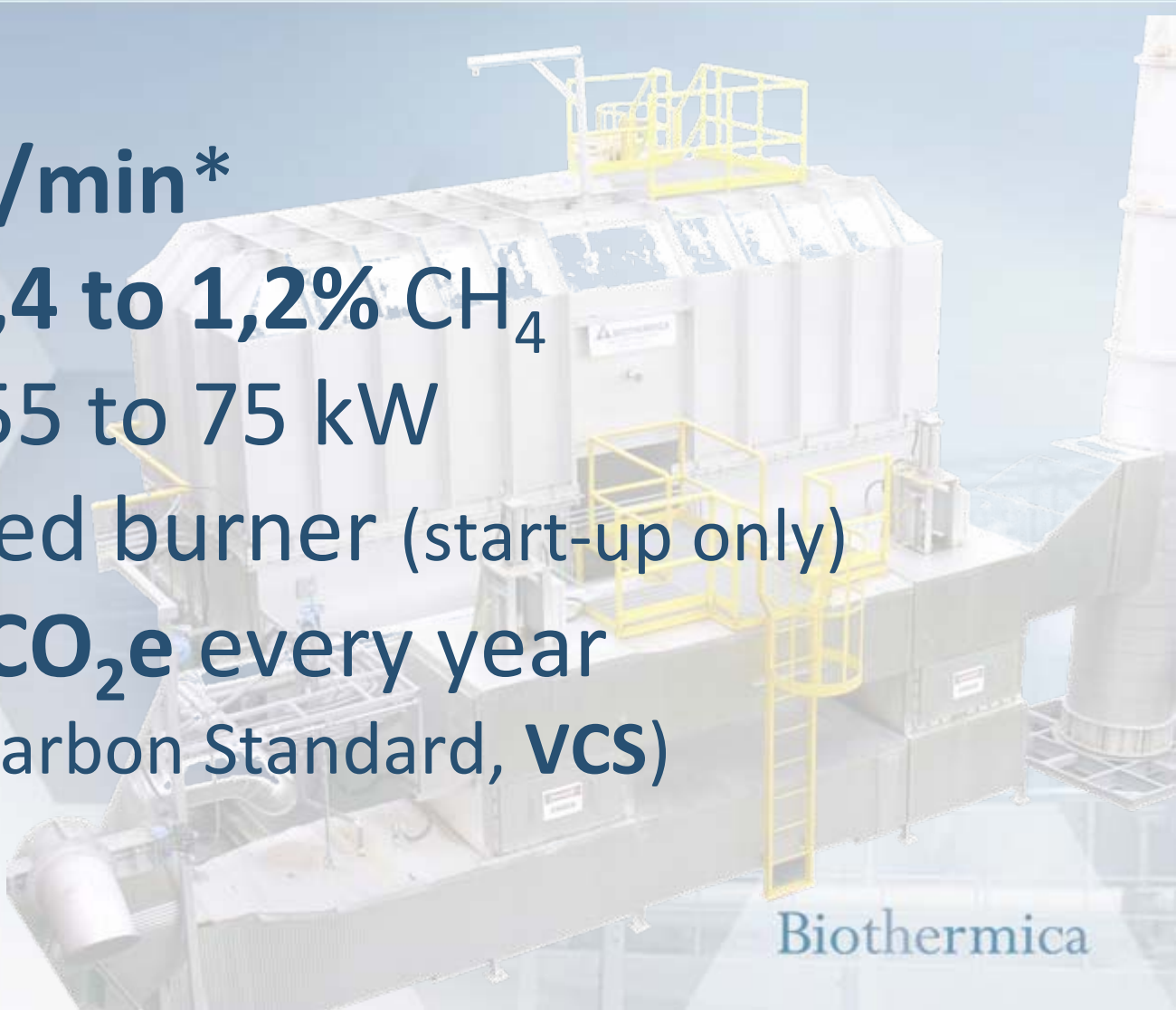
1st demonstration project

- Partnership with

  Jim Walter resources, inc.
  BLUE CREEK COAL - BROOKWOOD, ALABAMA
- Active mine no. 4
- **0,8% CH_4** average
- **Approved by MSHA** as part of the ventilation plan

Demonstration project higlights

- **30 000 ft³/min***
- Accepts **0,4 to 1,2%** CH_4
- Fan uses 55 to 75 kW
- Propane fed burner (start-up only)
- **≈40 000 tCO_2e** every year
  (Voluntary Carbon Standard, **VCS**)



*10% of available

Schedule is on track

2008

April	MSHA approval
May – June	Detailed design
July – Oct.	Fabrication & acquisition
Nov. – Dec.	Installation & dry run

2009

January	**Commissioning**

Vessel & insulated duct

Electricity & controls cabinet

Oxidation chamber loading

Project site

Who is...

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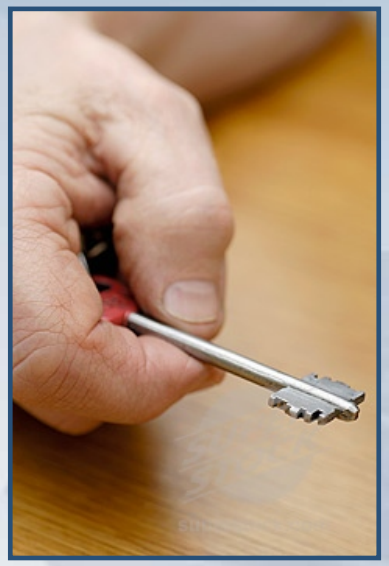
Biothermica's expertise

build



own

operate

(transfer)

Project developer since 1987

air pollution control

landfill gas

clean energy

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Contact information

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